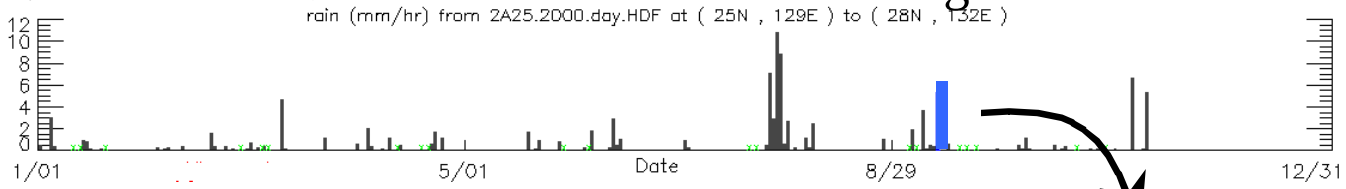
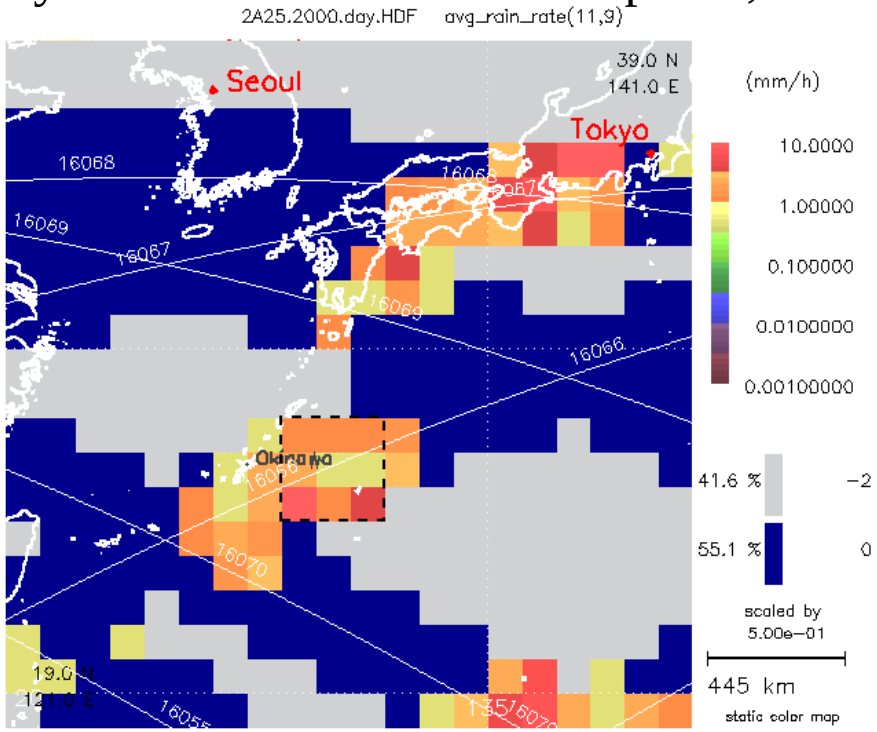
Using the TRMM Mission Index to Find Data of Interest in Six Terabytes of TRMM Rainfall Estimates

1. Time Series: PR Rain Rate in 2000 Averaged Near Okinawa



2. Daily Grid: PR Rain Rate on Sept. 11, 2000

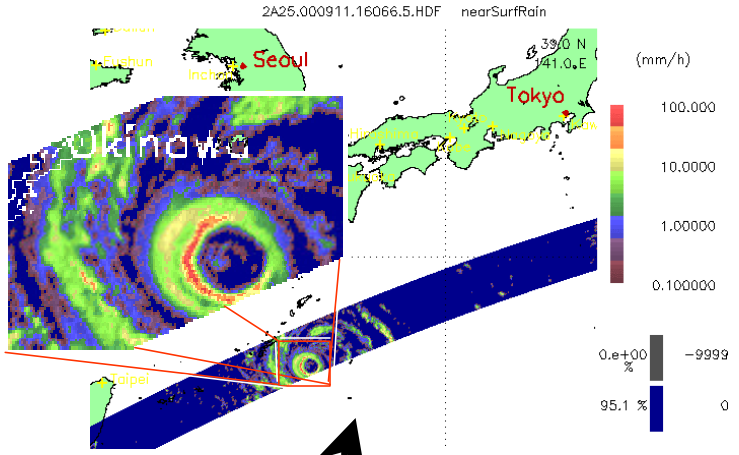


3. Order Files

TRMM Archive

4. Download Files

5. Super Typhoon Saomai: PR Rain Rate from 2A25, Sept. 11, 2000, Orbit #16066



Using the TRMM Mission Index to Find Data of Interest in Six Terabytes of TRMM Rainfall Estimates

Since its launch in 1997, the Tropical Rainfall Measuring Mission (TRMM) has created a large collection of rain estimates. [1] Over six terabytes of data have been produced from just two popular algorithms (2A12 and 2A25). These algorithms use observations from the TRMM Microwave Imager (TMI) and the Precipitation Radar (PR). The Precipitation Radar is the first satellite-borne instrument capable measuring the detailed three-dimensional structure of rain. The Japanese space agency built the Precipitation Radar as part of this joint United States and Japanese mission.

After launch, several scientists talked with analysists at the TRMM Science Data and Information System (TSDIS) about the difficulty they experienced in locating data of interest in such a large data set.

In 2001, TSDIS reported on a new method that it had developed to help scientists locate data of interest. [2] This method is called the Mission Index, and it is an enhancement to the TSDIS Orbit Viewer, a tool for displaying TRMM standard products.

Before using the Mission Index, the scientist installs the TSDIS Orbit Viewer on his computer and downloads the mission index files. Both are available from the TSDIS web site: [http://tsdis.gsfc.nasa.gov/orbitviewer.html]. The mission index files are a low-resolution version of the original orbital products that have the advantage of being five orders of magnitude smaller than the orbital products. An intermediate step in this data reduction is the 3G68 product developed by Erich Stocker at TSDIS. [3]

The steps to using the Mission Index are shown in the accompanying illustration. In Step 1, the scientist chooses a region of interest and the Orbit Viewer dynamically creates a time series of rain in that region over an entire year, based on the data in a mission index file. The scientist clicks on a peak of the time series to see a low-resolution image of that day's rain. In Step 2, the scientist reads from the low-resolution image the orbit number that interests him. In steps 3 and 4, the scientist orders and downloads the full-resolution file from the TRMM archive. In step 5, the scientist displays the full-resolution file in the Orbit Viewer.

As scientists work with the growing data set from the TRMM satellite, their data search needs become more apparent. Responding to their requests, the Orbit Viewer serves as an evolving tool for data search and display.

References

[1] For background information about TRMM, see the December 2000 special issues of the *Journal of Climate* and the *Journal of Applied Meteorology*. See also the TRMM Home Page: [http://trmm.gsfc.nasa.gov]. TRMM data provided by NASA / NASDA / CRL.

[2] Owen Kelley, John Stout, and Menas Kafatos. "Content-based Browsing of Data from the Tropical Rainfall Measuring Mission (TRMM)." Proceedings of the IEEE Scientific and Statistical Database Conference (SSDBM). George Mason University. Fairfax, Va. July 18-20, 2001.

[3] http://tsdis.gsfc.nasa.gov/trmmopen

For More Information

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